Roadmap for Connectivity Enhancement and Flagship Projects

Based on all the issues presented and the solutions proposed in the previous chapters, this chapter summarises the key development areas for the enhancement of connectivity and resilience in the Association of Southeast Asian Nations (ASEAN). Since ASEAN countries are divided into two categories, insular and continental, it is necessary to consider their relative specificities.

Therefore, this chapter differentiates between land connectivity and ocean connectivity, and proposes recommendations aiming at their enhancement. For each of them, after stating precise targets, the authors recommend specific actions that should be carried out to achieve those targets.

Better Land Connectivity

More than half of ASEAN countries – Cambodia, Lao People's Democratic Republic (Lao PDR), Malaysia (partially), Myanmar, Singapore, Thailand, and Viet Nam – are continental. Therefore, enhancing land connectivity must be a great priority for ASEAN.

Figure 22: Improved Land Connectivity with SGT
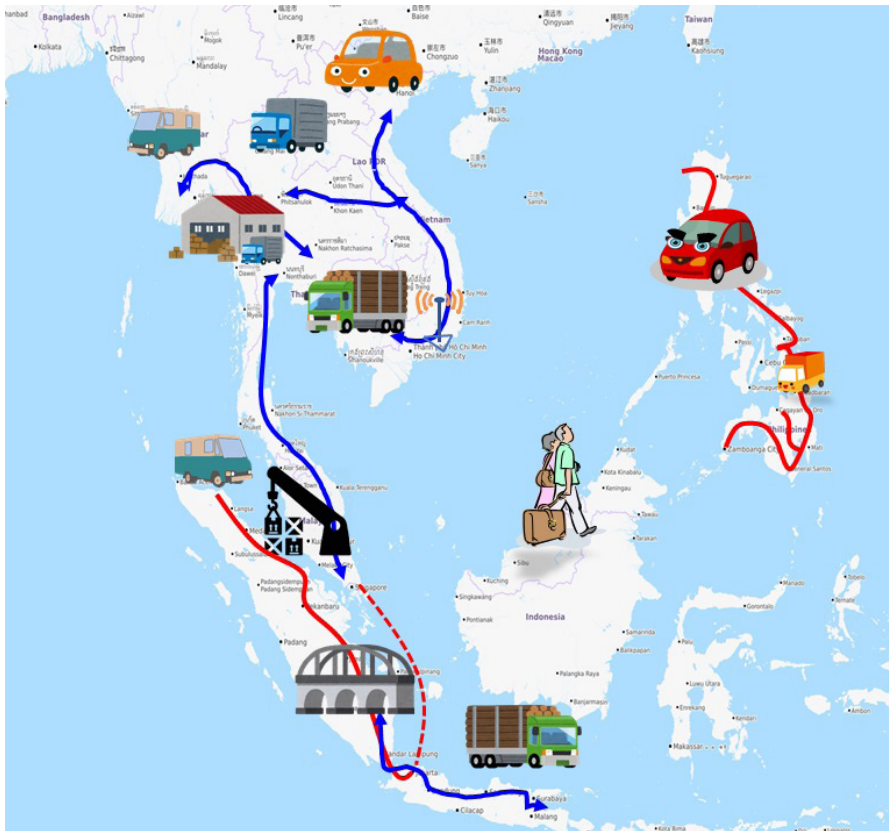
ASEAN = Association of Southeast Asian Nations, GNSS = global navigation satellite systems
SGT = space and geospatial technology.
Source: Authors.

Targets

1. Smoother and safer transport, logistics, and people flow
• Drastic cost reduction and accident reduction for mobility

2. Better and secure management of transportation (e.g. road pricing, cargo management, people mobility management)
• Better security and management, reduction of greenhouse gases (GHGs)

3. Accelerating implementation of autonomous vehicles, automation in transport, logistics, construction, agriculture/forestry, etc.
• Advanced/leading technologies and implementation

4. Providing advanced positioning services for safer mobility
• World-first services for safer and more secure mobility

Actions

1. Develop incubation centres of advanced positioning services and applications
(a) High precision, authentication (anti-spoofing)
(b) Support industrial development and business creation
(c) Model case: Global Navigation Satellite Systems (GNSS) incubation centre, Geo-Informatics and Space Technology Development Agency (GISTDA), Thailand

2. Establish connected networks of GNSS base stations
(a) Common location basis of ASEAN for better consistency and accuracy
(b) High-precision mapping, autonomous vehicles (logistics, public transport) and machines (logistics, agriculture, construction, etc.), crust monitoring
(c) Enhancing the National Spatial Data Infrastructure (NSDI) for better geospatial data dissemination and integration

3. Provide world-first advanced positioning services
(a) Free high-precision authentication service with Quasi–Zenith Satellite System (QZSS)
(b) Accelerate social implementation: road pricing, illegal vehicle detection, and secure logistics

4. Develop data sharing infrastructure and human resource development facility
(a) Logistics, transportation, people flow, autonomous vehicles, etc.
(b) Incubation of data experts serving better data usage and management

Better Sea Connectivity

Four ASEAN countries are either fully or partially insular. These are: Brunei Darussalam, Indonesia, Malaysia (partially), and the Philippines. Indonesia is one of the leading Asian economies. Moreover, except for Lao PDR, all ASEAN countries have access to the sea, prompting the improvement of sea connectivity.

Figure 23: Improved Sea Connectivity with SGT
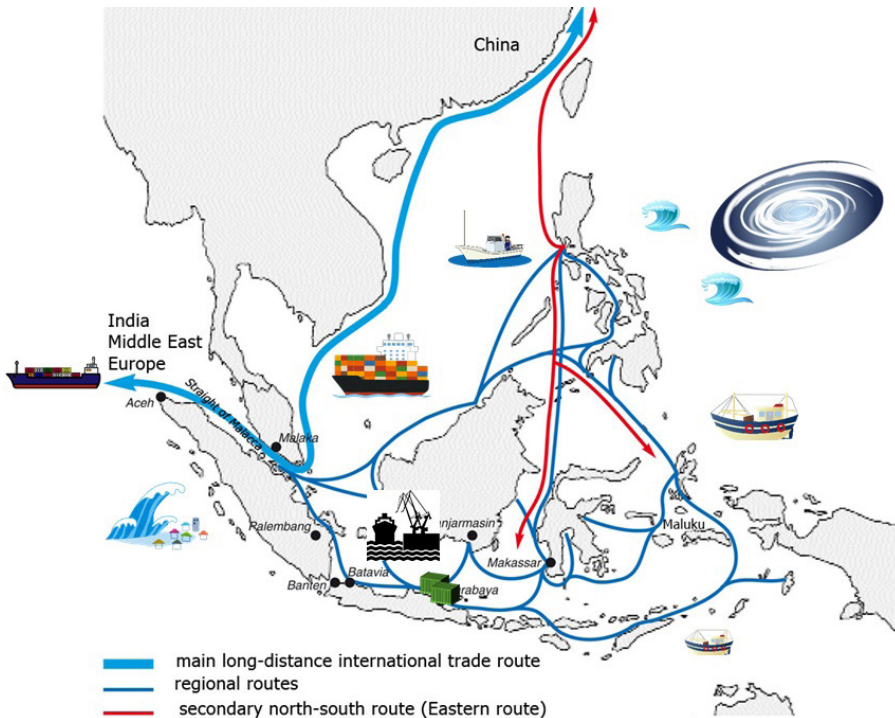
SGT = space and geospatial technology.

Source: Authors

Targets

1. Smoother and safer transport and logistics in the seas
2. Reduction of cost/time and marine incidents
3. Safer and more secure industrial activities in the seas
4. Accident reduction and better control of sea activities
5. Sustainable management and development of natural resources
6. Control of natural resource development and conservation of ecosystems

Actions

1. Develop a marine weather forecast and application centre
(a) More accurate and integrated marine weather monitoring and forecasting
i. Numerical models, data assimilation, and satellite data like Himawari
(b) Provide marine data for marine industrial activities such as fishery and
aquaculture

(c) Incubate advanced applications for fishery, aquaculture, and environmental management

(d) Model case: Institute for Marine Research and Observation IMRO (Indonesia)

2. Expand world-first advanced positioning services

(a) Free and precise authentication service with QZSS in the seas and ocean

(b) Accelerate social implementation: monitoring and control of fishery, detecting unidentified ships, secure marine logistics, automation of cargo handling etc.

3. Develop data sharing infrastructure and human resource development facility

(a) Marine and land weather, marine logistics, transportation, etc.

(b) Integration of space data and in-situ data

(c) Incubation of data experts serving better data usage and management

Flagship Projects for the Development of Data Sharing Infrastructure and Related Human Resources

To demonstrate the efficiency of SGT in the enhancement of ASEAN connectivity, the authors present potential flagship projects as well as implementing agencies.

Beyond the development of data sharing space infrastructure (satellite and ground systems), these projects aim to:

1. Promote human resource development for advanced data analysis and usage, including artificial intelligence and the Internet of Things (IoT) technologies.

2. Demonstrate best practices of data sharing and integration

Concretely, the proposed flagship projects focus on:

1. Land applications focusing on positioning services, implemented by the GNSS Innovation Center of GISTDA, Thailand

2. Marine applications driven by IMRO of Indonesia

3. Disaster response and risk management, supervised by the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management (AHA Centre) in Jakarta, Indonesia

4. National Space Data Infrastructure and geospatial application centres in each member country.